DINOSAURS!

•DISCOVER THE GIANTS OF THE PRE LD•

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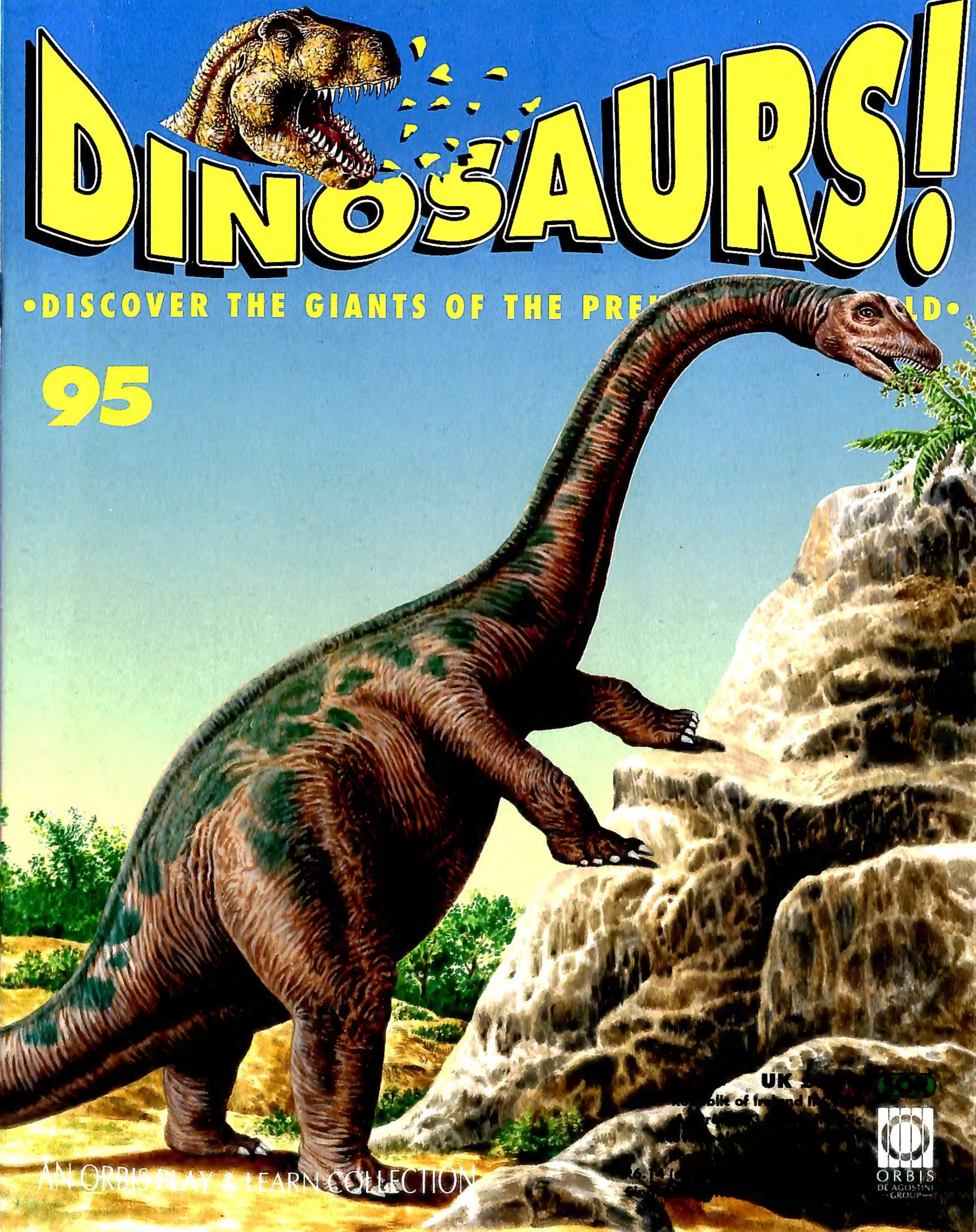

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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •

IDENTIKIT

Meet an amazing, toothless pterosaur and two dinosaurs
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TAPEJARA

Sporting extraordinary bony crests, *Tapejara* was one of the most remarkable-looking pterosaurs.

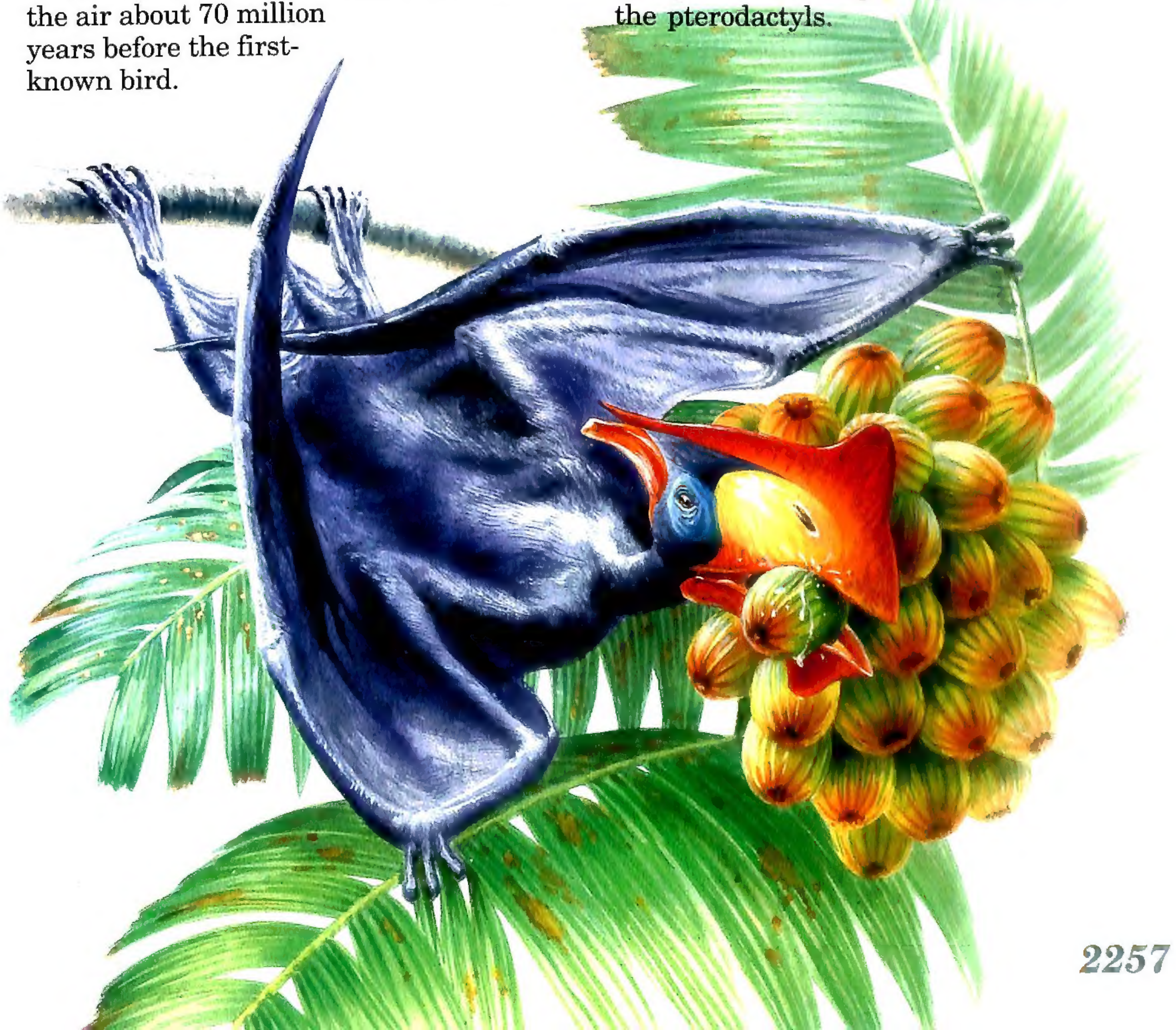
The dinosaurs were the masters of the land in the Mesozoic Period, but the pterosaurs were the rulers of the skies. The flying reptiles lifted off on 'wings' made of skin. Rather like today's bats, they soared and fluttered through the air about 70 million years before the first-known bird.

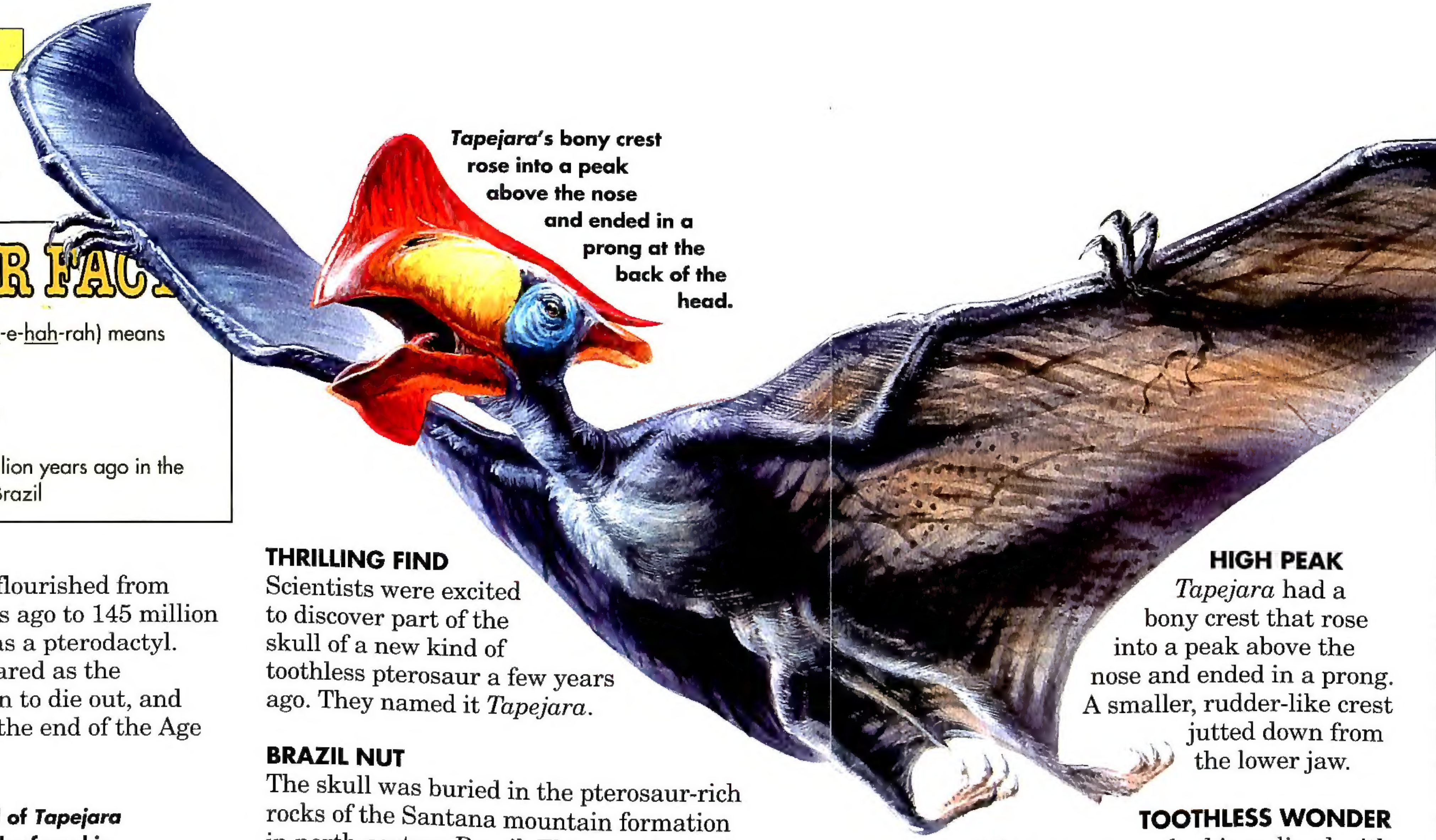
HAPPY MEDIUM

Just like the dinosaurs, pterosaurs came in many different shapes and sizes. The smallest was no bigger than today's blackbird, while the largest was the same size as a glider aircraft. *Tapejara* was somewhere in the middle. It had a wingspan of about 1.5m.

PTEROSAUR GROUPS

Pterosaurs are divided into two main groups – the rhamphorhynchs and the pterodactyls.





Tapejara's bony crest rose into a peak above the nose and ended in a prong at the back of the head.

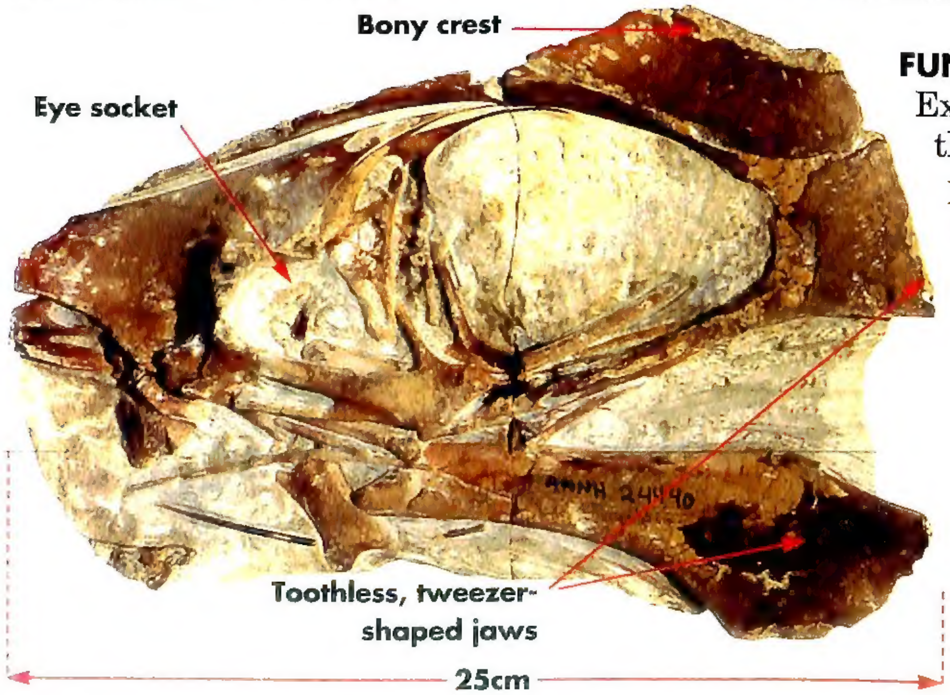
MONSTER FAC

- **NAME:** *Tapejara* (tap-e-hah-rah) means 'the old being'
- **GROUP:** pterosaur
- **SIZE:** 1.5m wingspan
- **FOOD:** fruit
- **LIVED:** about 120 million years ago in the Cretaceous Period in Brazil

OLD SURVIVORS

The rhamphorhynchs flourished from about 220 million years ago to 145 million years ago. *Tapejara* was a pterodactyl. The pterodactyls appeared as the rhamphorhynchs began to die out, and they survived right to the end of the Age of the Dinosaurs.

This almost complete skull of *Tapejara* is the second specimen to be found in the Santana mountain formation in Brazil. It includes the lower jaw.



THRILLING FIND

Scientists were excited to discover part of the skull of a new kind of toothless pterosaur a few years ago. They named it *Tapejara*.

BRAZIL NUT

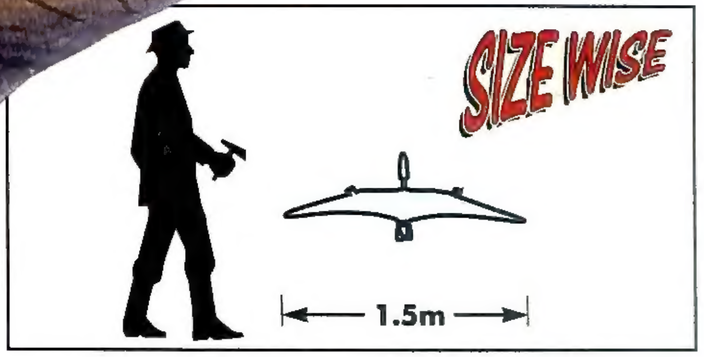
The skull was buried in the pterosaur-rich rocks of the Santana mountain formation in north-eastern Brazil. This area is world famous for the number of fossils that have been found there.

FUNNY IN THE HEAD

Experts continued to excavate the same area. Their efforts paid off. They were delighted to find a second, almost complete, skull of *Tapejara*. It clearly showed the pterosaur's oddly shaped head and crest.

Tapejara's toothless jaws puzzled scientists. They concluded that it wouldn't have been able to catch and eat fish, but may have fed on fruit and berries, like today's toucan (right).

SIZE WISE



HIGH PEAK

Tapejara had a bony crest that rose into a peak above the nose and ended in a prong. A smaller, rudder-like crest jutted down from the lower jaw.

TOOTHLESS WONDER

Most pterosaurs had jaws lined with sharp teeth to snap up fish. But *Tapejara* had no teeth and therefore must have fed quite differently.

FRUITFUL RESEARCH

Tapejara's toothless jaws were shaped rather like a large pair of tweezers. Scientists were puzzled as to how *Tapejara* fed. They pieced together the evidence and came up with a remarkable solution. They decided *Tapejara* must have had a beak designed to feed on fruit. *Tapejara* is the first-known fruit-eating pterosaur. It probably tackled its food like a modern hornbill, or toucan. The pterosaur could have pushed the leaves aside with its bony crest and plucked the ripe fruit between its tweezer-like jaws.

IT'S A FACT

PTEROSAUR POWER

Some plants today rely on fruit-eating birds to help them survive. The birds spread the seeds through their droppings. Many millions of years ago, *Tapejara* would have played the same important role. By eating the fruit and scattering the seeds, *Tapejara* helped prehistoric plants to flourish.

CETIOSAURISCUS

Long-necked *Cetiosauriscus* was a plant-eating dinosaur from Britain.

Cetiosauriscus belonged to the diplodocid family, named after *Diplodocus*. At 15m, it was about half the length of *Diplodocus*.

MONSTER FACTS

- **NAME:** *Cetiosauriscus* (see-tee-uh-saw-ris-kus) means 'whale-like lizard'
- **GROUP:** dinosaur
- **SIZE:** about 15m long
- **FOOD:** plants
- **LIVED:** 181 to 169 million years ago in the Middle to Late Jurassic Period in England

FOUND IN BRITAIN

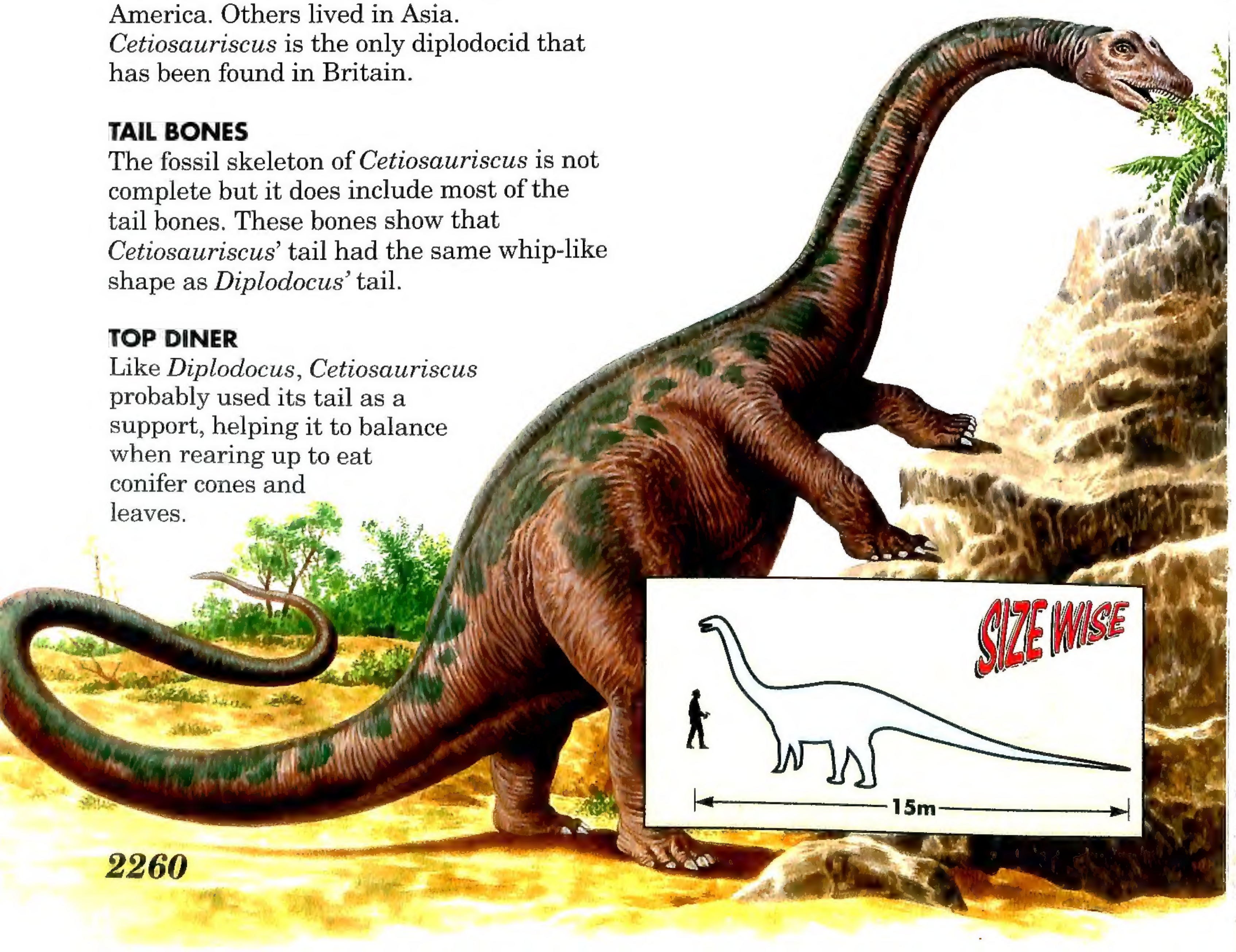
Many diplodocids, including *Diplodocus*, roamed the wooded plains of North America. Others lived in Asia. *Cetiosauriscus* is the only diplodocid that has been found in Britain.

TAIL BONES

The fossil skeleton of *Cetiosauriscus* is not complete but it does include most of the tail bones. These bones show that *Cetiosauriscus*' tail had the same whip-like shape as *Diplodocus*' tail.

TOP DINER

Like *Diplodocus*, *Cetiosauriscus* probably used its tail as a support, helping it to balance when rearing up to eat conifer cones and leaves.



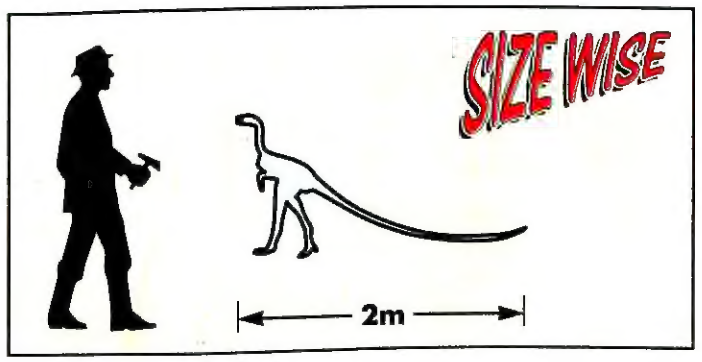
ALVAREZSAURUS

This small, speedy, long-tailed hunter was a very unusual looking, meat-eating dinosaur.

South American *Alvarezsaurus* has been classified as a whole new family. This is because it was so unlike the carnivorous dinosaurs that lived in North America at the same time. Scientists have called the family Alvarezsauridae.

ON THE SPOT

Experts discovered the fossil bones of *Alvarezsaurus* sticking out of a river bank in 1987. By an amazing coincidence, the dinosaur was found right next to a natural history museum!



MONSTER FACTS

- **NAME:** *Alvarezsaurus* (al-vuh-rez-saw-rus) means 'Alvarez lizard'
- **GROUP:** dinosaur
- **SIZE:** 2m long
- **FOOD:** meat
- **LIVED:** about 80 million years ago in the Late Cretaceous Period in Argentina

BUILT FOR SPEED

Alvarezsaurus was a lightly built, two-legged meat-eater. It must have looked a bit like the 'ostrich dinosaurs' that lived at the same time in North America. The South American dinosaur probably sprinted after its prey in the same way.

TALL TALE

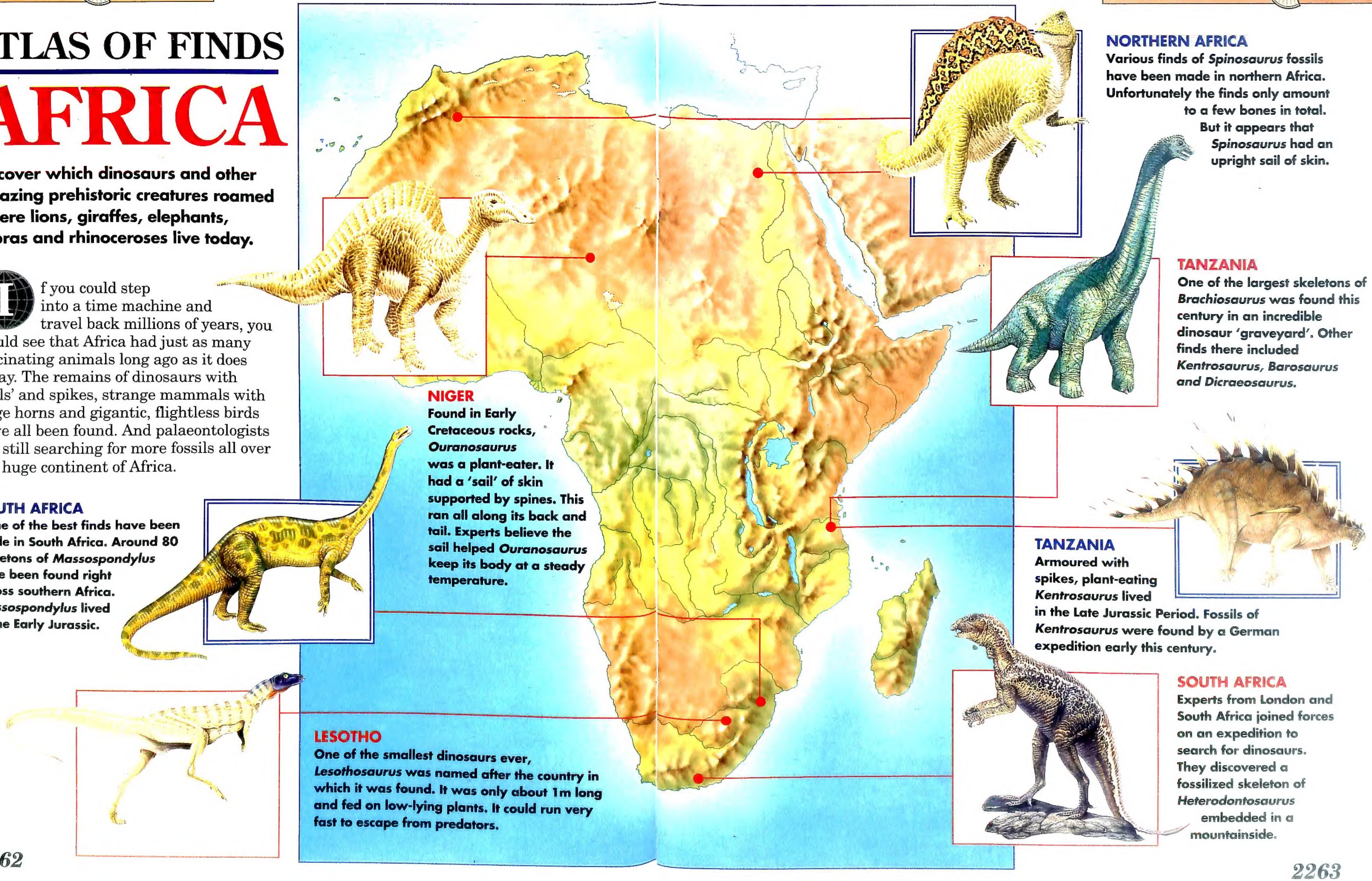
Alvarezsaurus, however, had a much longer tail than these dinosaurs. In fact, experts have calculated that the dinosaur must have been nearly all tail!

ATLAS OF FINDS

AFRICA

Discover which dinosaurs and other amazing prehistoric creatures roamed where lions, giraffes, elephants, zebras and rhinoceroses live today.

If you could step into a time machine and travel back millions of years, you would see that Africa had just as many fascinating animals long ago as it does today. The remains of dinosaurs with 'sails' and spikes, strange mammals with huge horns and gigantic, flightless birds have all been found. And palaeontologists are still searching for more fossils all over the huge continent of Africa.



SOUTH AFRICA

Some of the best finds have been made in South Africa. Around 80 skeletons of *Massospondylus* have been found right across southern Africa. *Massospondylus* lived in the Early Jurassic.

NIGER

Found in Early Cretaceous rocks, *Ouranosaurus* was a plant-eater. It had a 'sail' of skin supported by spines. This ran all along its back and tail. Experts believe the sail helped *Ouranosaurus* keep its body at a steady temperature.

LESOTHO

One of the smallest dinosaurs ever, *Lesothosaurus* was named after the country in which it was found. It was only about 1m long and fed on low-lying plants. It could run very fast to escape from predators.

NORTHERN AFRICA

Various finds of *Spinosaurus* fossils have been made in northern Africa. Unfortunately the finds only amount to a few bones in total. But it appears that *Spinosaurus* had an upright sail of skin.

TANZANIA

One of the largest skeletons of *Brachiosaurus* was found this century in an incredible dinosaur 'graveyard'. Other finds there included *Kentrosaurus, Barosaurus* and *Dicraeosaurus*.

TANZANIA

Armoured with spikes, plant-eating *Kentrosaurus* lived in the Late Jurassic Period. Fossils of *Kentrosaurus* were found by a German expedition early this century.

SOUTH AFRICA

Experts from London and South Africa joined forces on an expedition to search for dinosaurs. They discovered a fossilized skeleton of *Heterodontosaurus* embedded in a mountainside.

The skull (right) and a restoration (left) of the prehistoric, horned mammal *Arsinoitherium.*

AFRICAN MAMMAL

Looking rather like an exotic rhinoceros, *Arsinoitherium* sploshed through swamps in what is now north Africa. It lived about 38 million years ago and browsed on tough-leaved plants. It was one of the largest plant-eaters living in Africa at the time.

FROM RIVERS TO DESERTS

Fossil skeletons are sometimes discovered in deserts because the sand blows away, leaving the bones exposed. The Sahara Desert is the biggest desert in the world and covers a huge part of Africa, including much of the country of Niger. Saharan Desert expeditions have made many finds, including *Ouranosaurus*. But this dinosaur didn't live in the desert. When it was alive, 115 million years ago, the region had rivers and plants.

BIG DIG

Tendaguru in Tanzania is one of the most important dinosaur sites in Africa. From 1908 to 1912, one of the biggest ever dinosaur excavations was carried out there.

Is it true that the huge bird *Aepyornis* is a legend?

Yes and no. The gigantic bird *Aepyornis maximus* really did exist on Madagascar, an island off the coast of Africa. However, storytellers turned it into a legendary bird called the 'roc' – a fearsome creature that devoured sailors. The real bird only became extinct in about AD1700.

Spinosaurus (left) hunted in Cretaceous Africa.

Stomach stones (above) are found where plant-eaters without grinding teeth have been fossilized.

DIGGING IN THE RAIN

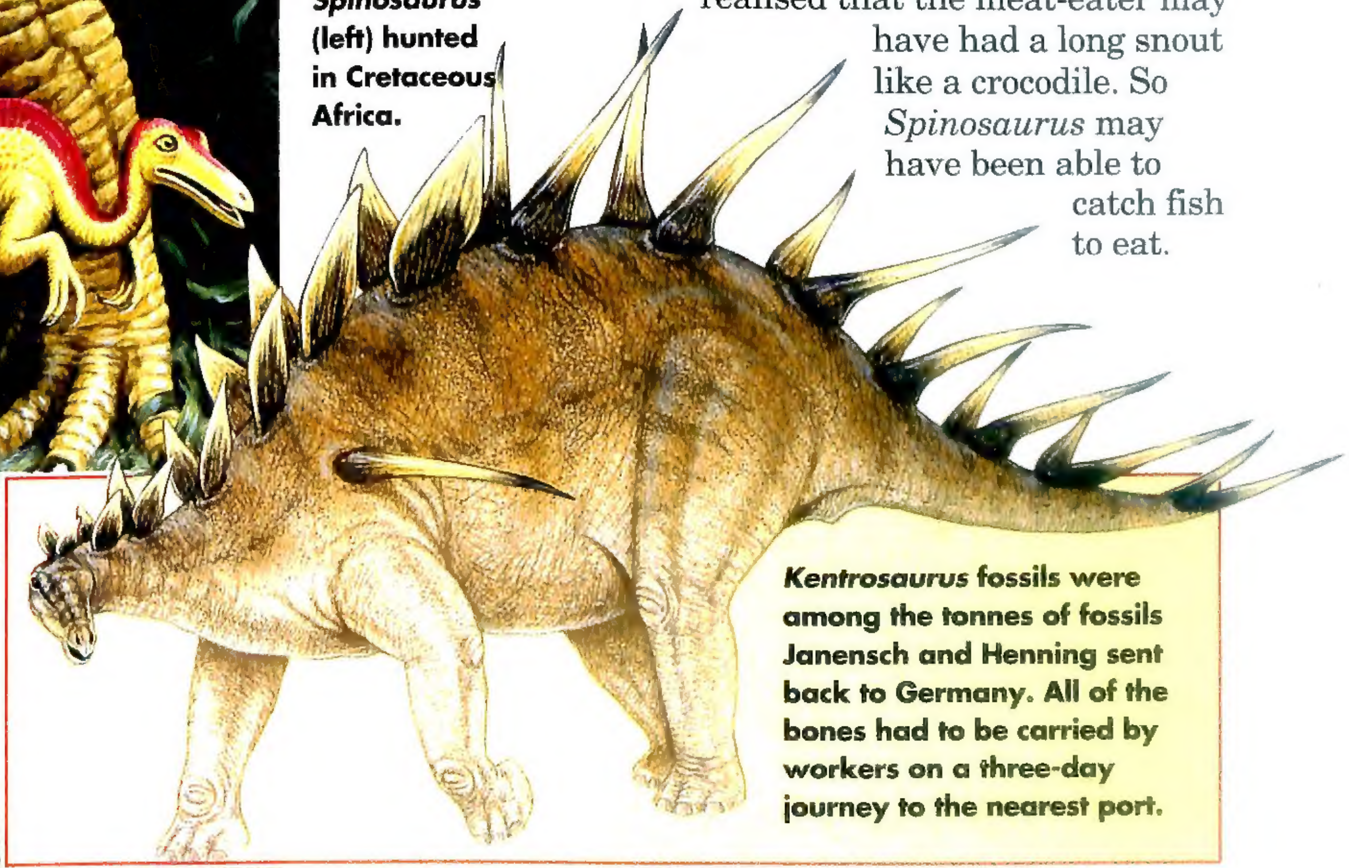
Two German palaeontologists, Werner Janensch and Edwin Henning, and their African teams, worked at Tendaguru. They collected more than 200 tonnes of dinosaur bones, although great heat and torrential rain made the working conditions very tough.

NAMED WITH HONOUR

Massospondylus was one of the very first dinosaurs to be described and named. It was an early plant-eater and would have swallowed stomach stones to help it grind up tough plants. Its remains were first discovered in the nineteenth century in South Africa and shipped to the British Museum for identification.

GONE FISHING?

When French palaeontologist Eric Buffetaut studied part of the skull of *Spinosaurus* found in northern Africa, he realised that the meat-eater may have had a long snout like a crocodile. So *Spinosaurus* may have been able to catch fish to eat.

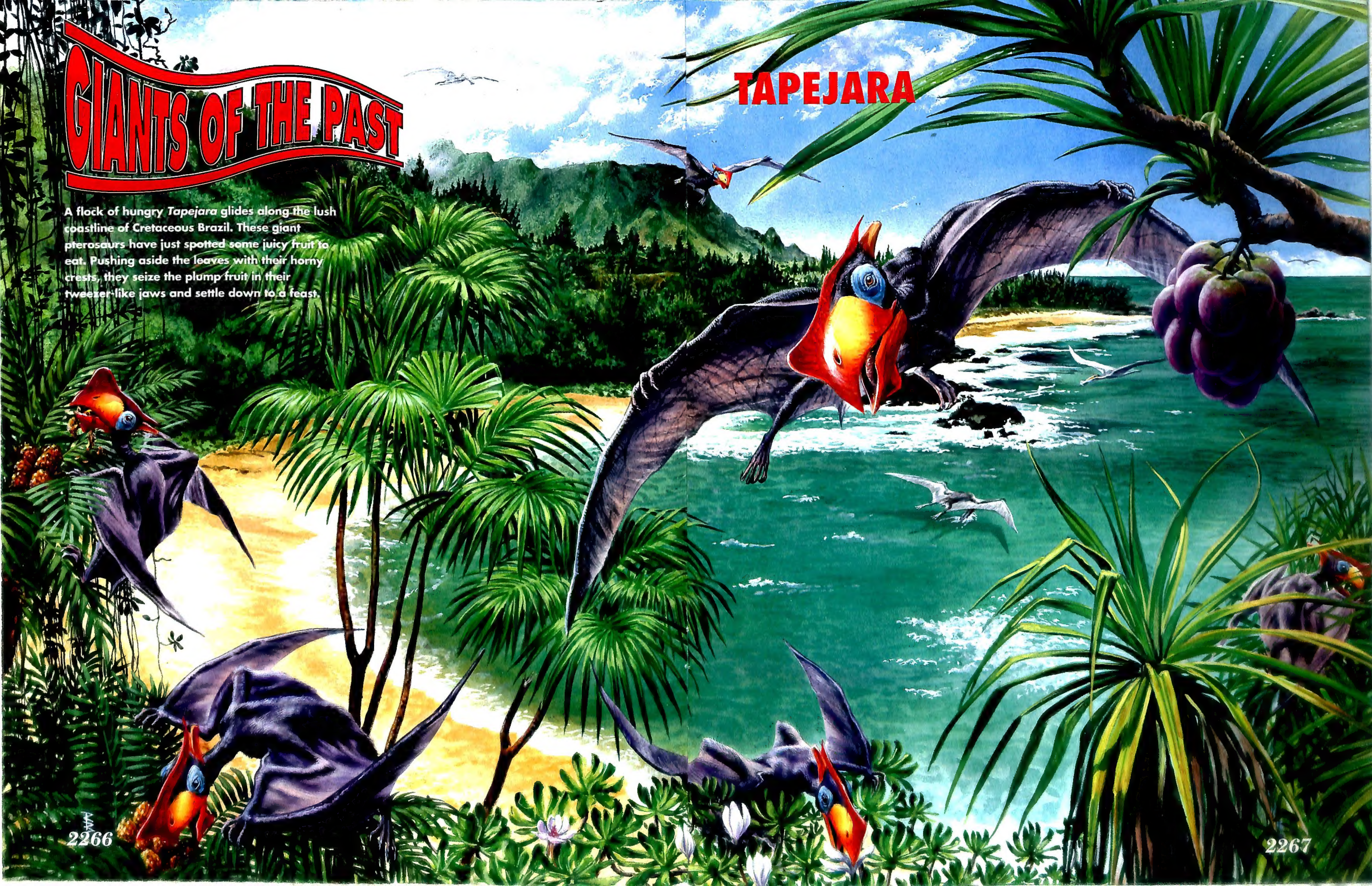


***Kentrosaurus* fossils were among the tonnes of fossils Janensch and Henning sent back to Germany. All of the bones had to be carried by workers on a three-day journey to the nearest port.**

GIANTS OF THE PAST

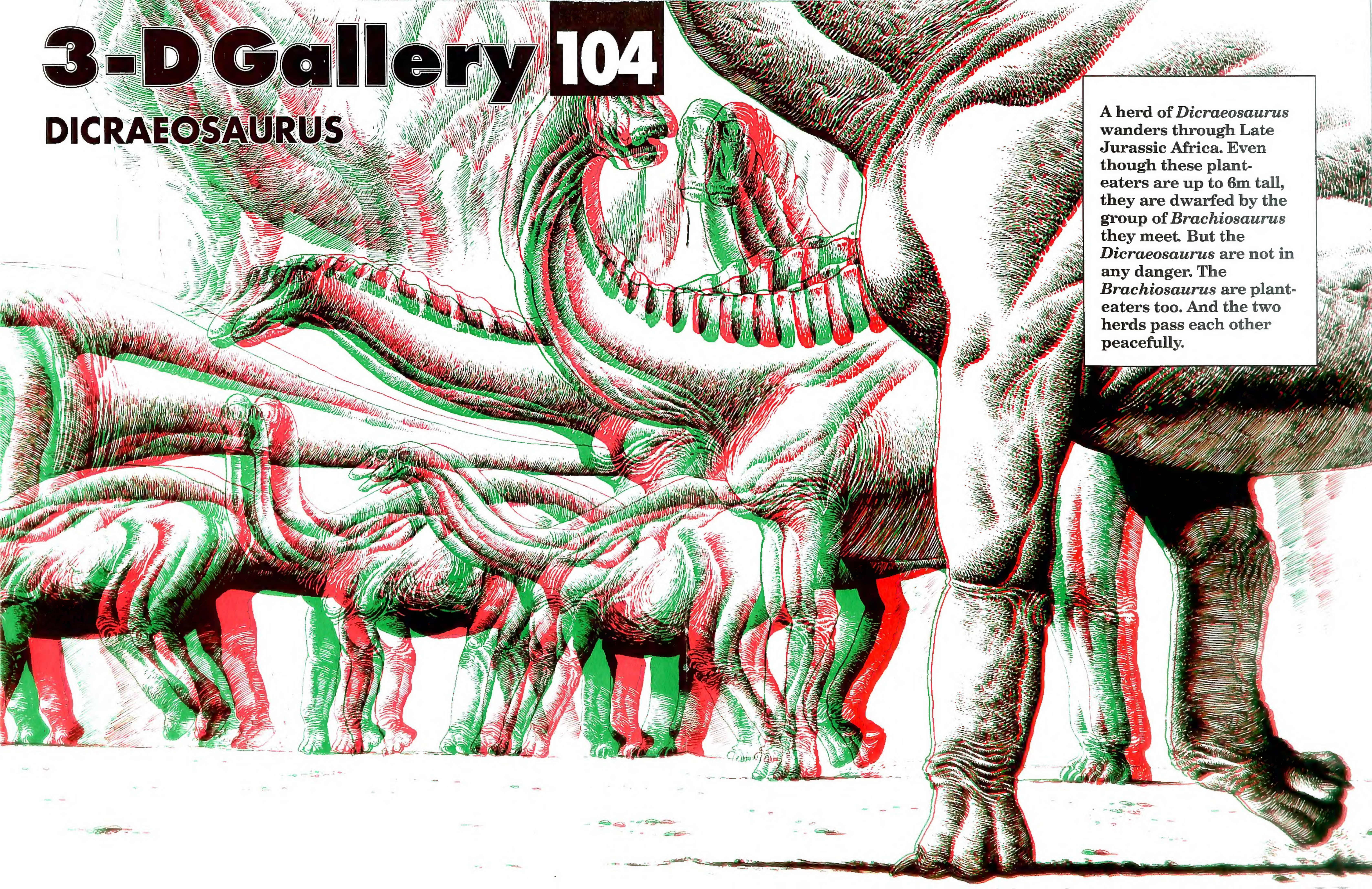
TAPEJARA

A flock of hungry *Tapejara* glides along the lush coastline of Cretaceous Brazil. These giant pterosaurs have just spotted some juicy fruit to eat. Pushing aside the leaves with their horny crests, they seize the plump fruit in their tweezer-like jaws and settle down to a feast.



3-D Gallery 104

DICRAEOSAURUS



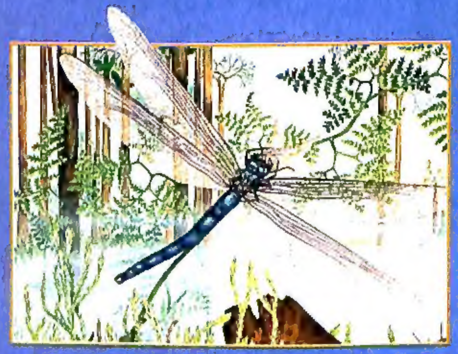
A herd of *Dicraeosaurus* wanders through Late Jurassic Africa. Even though these plant-eaters are up to 6m tall, they are dwarfed by the group of *Brachiosaurus* they meet. But the *Dicraeosaurus* are not in any danger. The *Brachiosaurus* are plant-eaters too. And the two herds pass each other peacefully.

On Parade: invertebrates

The animals pictured on these pages are all invertebrates — animals without backbones. Their success story began hundreds of millions of years ago, long before dinosaurs walked the Earth.

These ancient minibeasts developed to live in every place on Earth. Many lived in seas and ponds, while others crawled on the land, burrowed into the soil or took to the air. Some of these invertebrates can still be seen today and they look very much the same as they did in prehistoric times.

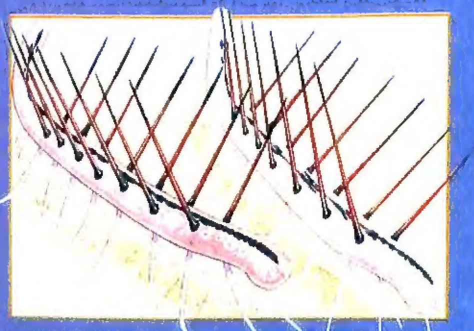
NAME: *Arthropleura*
GROUP: millipede
SIZE: 2m long
LIVED: Carboniferous
FOOD: rotting plants



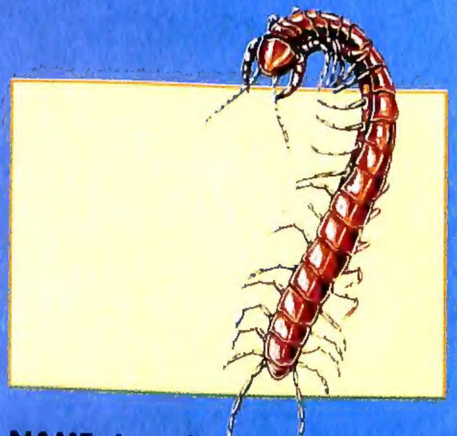
NAME: *Meganeura*
GROUP: insect
SIZE: 70cm wingspan
LIVED: Late Carboniferous
FOOD: small insects

NAME: *Pleurotomaria*
GROUP: gastropod mollusc
SIZE: 5cm high
LIVED: Jurassic and Cretaceous
FOOD: plants

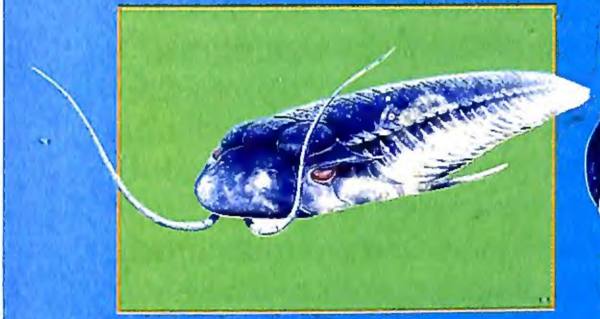
NAME: *Cyclophthalamus*
GROUP: arachnid (scorpion)
SIZE: 12cm long
LIVED: Carboniferous
FOOD: probably small insects



NAME: *Hallucigenia*
GROUP: unknown sea animal
SIZE: about 3cm long
LIVED: Cambrian
FOOD: dead sea creatures



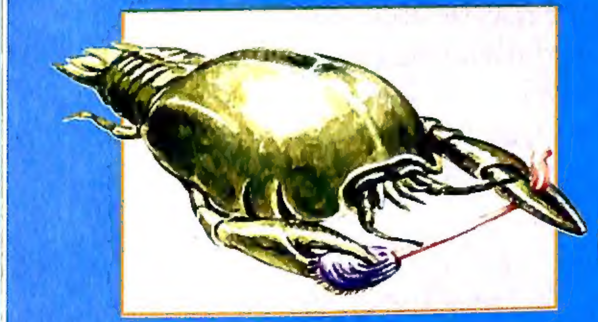
NAME: *Latzelia*
GROUP: centipede
SIZE: about 30cm long
LIVED: Carboniferous
FOOD: worms and soft insects



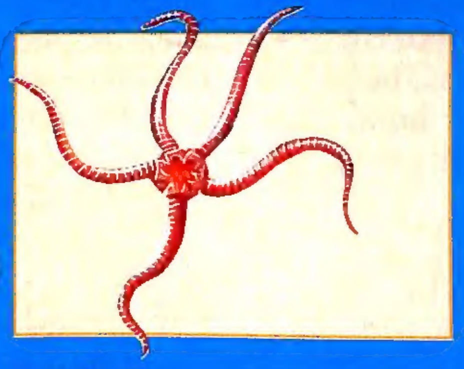
NAME: *Uralichas*
GROUP: trilobite
SIZE: 70cm long
LIVED: Ordovician
FOOD: particles on sea bed

NAME: *Pterygotus*
GROUP: sea scorpion
SIZE: 2m long
LIVED: Silurian and Devonian
FOOD: fish

NAME: *Archidesmus*
GROUP: millipede
SIZE: about 30cm long
LIVED: Devonian
FOOD: plants



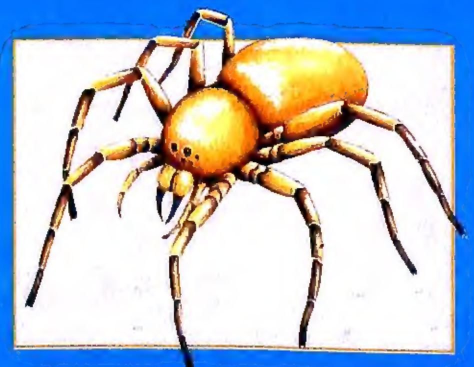
NAME: *Eryon*
GROUP: crustacean
SIZE: 10cm long
LIVED: Jurassic/Cretaceous
FOOD: small sea creatures



NAME: *Geocoma*
GROUP: echinoderm
SIZE: about 10cm across
LIVED: Jurassic
FOOD: small particles

NAME: *Gonioteuthis*
GROUP: cephalopod mollusc
SIZE: 27cm long
LIVED: Late Cretaceous
FOOD: small sea creatures

NAME: *Stephanoceras*
GROUP: cephalopod mollusc
SIZE: 20cm high
LIVED: Jurassic
FOOD: small sea creatures



NAME: *Arthrolycosa*
GROUP: arachnid
SIZE: about 7cm long
LIVED: Carboniferous
FOOD: small animals

KEY

CAMBRIAN PERIOD
570-505 MYA
ORDOVICIAN PERIOD
505-438 MYA
SILURIAN PERIOD
438-408 MYA
DEVONIAN PERIOD
408-362 MYA
CARBONIFEROUS PERIOD
362-290 MYA
PERMIAN PERIOD
290-245 MYA
TRIASSIC PERIOD
245-208 MYA
JURASSIC PERIOD
208-145 MYA
CRETACEOUS PERIOD
145-66 MYA

Plants v Plant-eaters

The battle between plants and animals began in the oceans millions of years ago, when the first tiny, green plant cells were swallowed by the first minute animal cells.

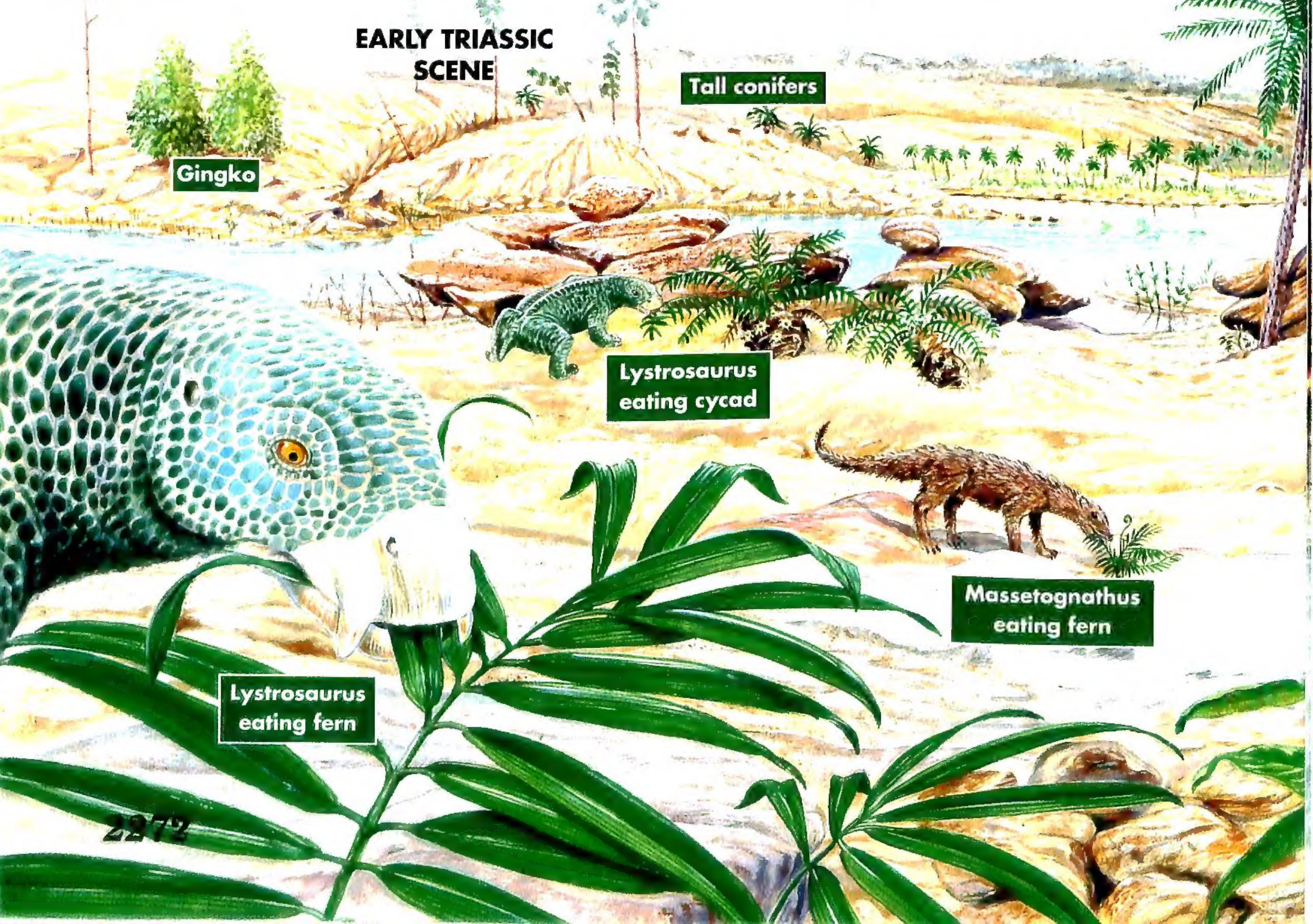
When life spread on to the land, the war between plants and plant-eaters continued. You might think that there is not much a plant could do to defend itself. But, in fact, plants evolved many ways of protecting themselves.

PRICKLY, SMELLY AND FAST

Some land plants developed tough fibres, prickly scales and spines. Others produced nasty-tasting chemicals. Some plants stayed out of the reach of hungry herbivores by growing very tall or by developing spreading, underground stems. Other plants grew and reproduced very fast, so that they were not overgrazed.

TEETH AND GUTS

Plant-eaters, in their turn, had to evolve ways to deal with all these defences. Some grew tusks that could pull and tear at a plant. Others developed strong teeth or beaks that could slice and crunch. Grinding stones pulped tough plants in the stomachs of some herbivores, while others had stomachs full of bacteria that could break up plant fibres.


EARLY TRIASSIC SCENE

TRIASSIC TUSSLE

During the Early Triassic, about 240 million years ago, the weather was hot and dry, and much of the land was desert. But wherever there was water, plants flourished. And reptiles came to eat them. Dicynodonts, such as *Lystrosaurus*, and herbivorous cynodonts, such as *Massetognathus*, browsed on tough, woody gingkos, cycads, conifers and tree ferns.

PLANTS UNDER ATTACK

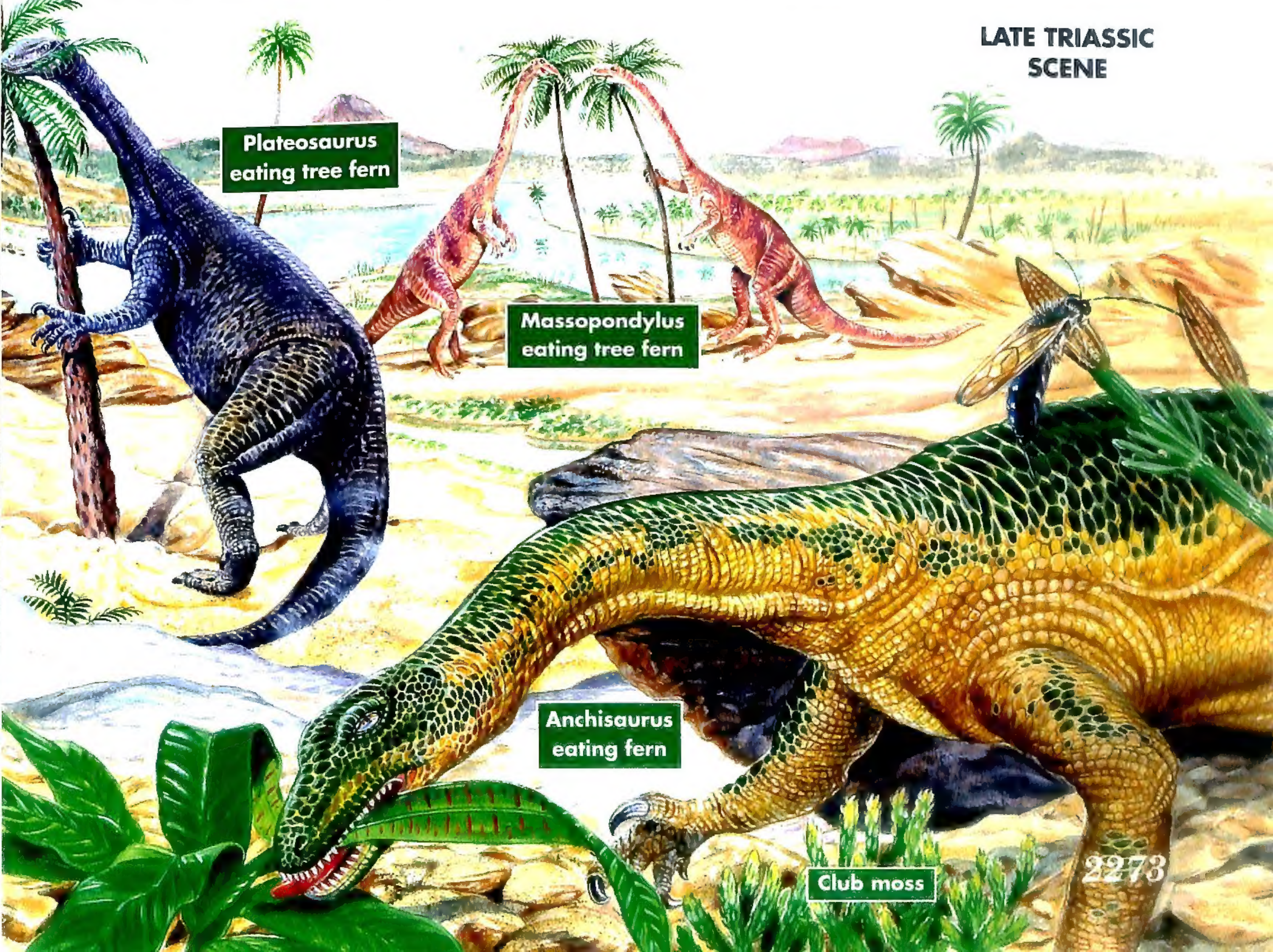
By the Mid-Triassic, rhynchosaurs such as *Hyperodapedon* had become the most successful plant-eaters of the time. They dug up roots with their strong, clawed feet. They prodded and pulled at stems and branches with their bony beaks.

THE PLANTS RESPOND

Bands of rhynchosaurs munched through the undergrowth and ignored the foliage higher up. So the taller plants flourished. By the end of the Triassic, forests of great trees had replaced the ground-cover plants and the rhynchosaurs gradually died out.

DINOSAURS ARRIVE

The place of the rhynchosaurs was taken by a group that could reach the top of tall trees – the prosauropods. The plant-eating prosauropods were ancestors of the huge sauropod dinosaurs. *Plateosaurus*, *Anchisaurus* and *Massospondylus* were prosauropods. The first prosauropods appeared in the late Triassic, about 210 million years ago.


LATE TRIASSIC SCENE

SKYSCRAPER RESTAURANT

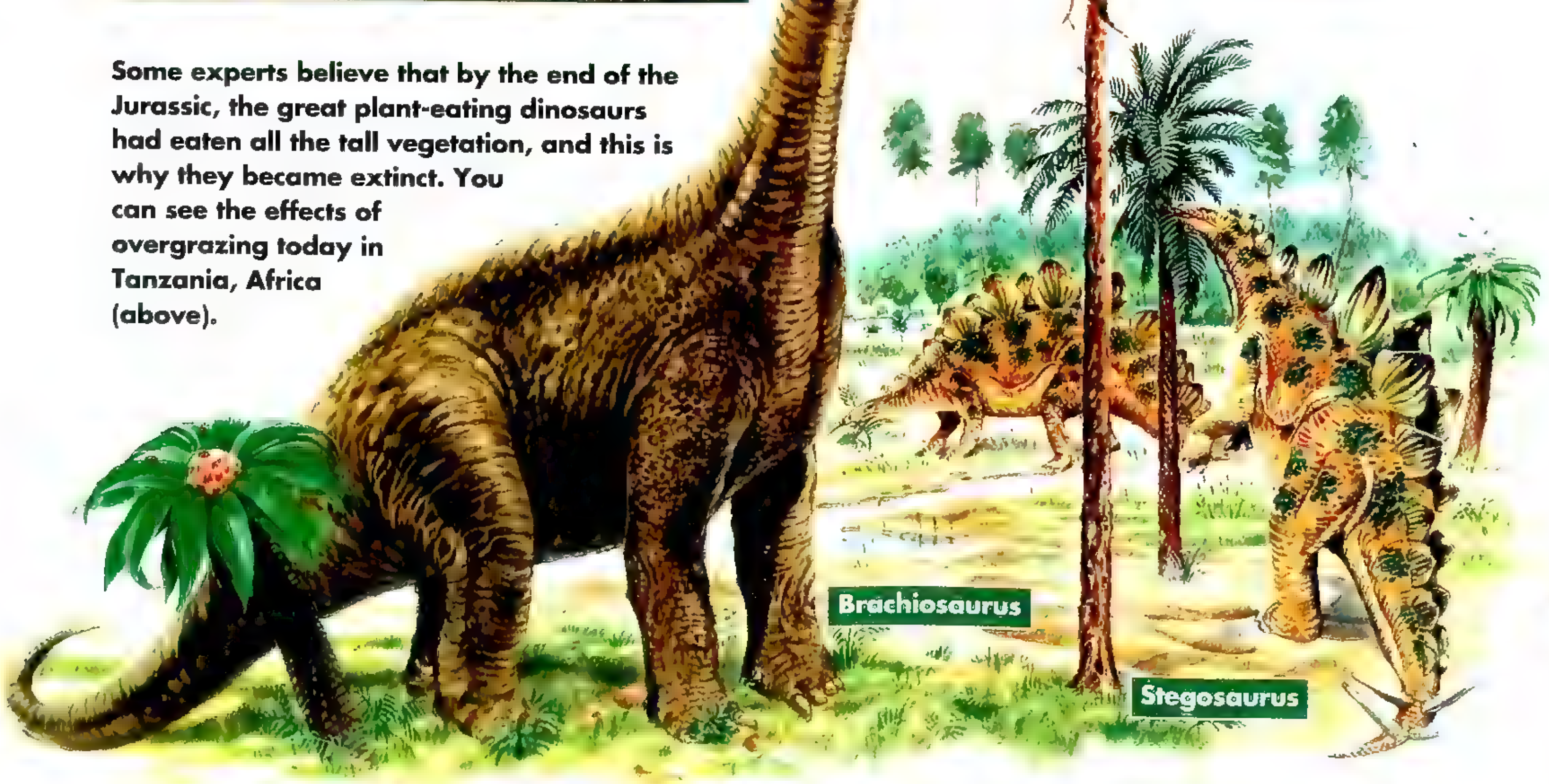
By the Jurassic Period, around 145 million years ago, the climate had become warm and wet. The plants grew taller and in greater variety. As the plants prospered so did the animals, in particular the dinosaurs. The conifers grew ever taller and the dinosaurs had to find ways to reach the tender young leaves.

Some experts believe that by the end of the Jurassic, the great plant-eating dinosaurs had eaten all the tall vegetation, and this is why they became extinct. You can see the effects of overgrazing today in Tanzania, Africa (above).

GOING UP...

One way was to stand up on hind legs. *Stegosaurus* could do this. It could tip its weight backwards over its huge back legs. It used its thick tail as the third leg of a tripod. *Brachiosaurus*, one of the largest dinosaurs, developed in another way. It had a long neck and long front legs to reach into the trees. *Diplodocus* also had a very long neck. Standing on its hind legs, it could reach over 12m into the tree tops. These dinosaurs had peg-like teeth to rake the leaves from the stems. They could not chew, but had stones in their stomachs to pound the goodness out of the plants.

JURASSIC SCENE



UNSTOPPABLE HERDS

These great dinosaurs wandered across the land, stripping the leaves from the tall trees. By the end of the Jurassic, many experts think there was little tall vegetation left for these huge herbivores to eat and, after a long and successful reign, they too died out.

BILLS AND BEAKS

Meanwhile, at the feet of the sauropods, the low-growing plants had flourished. New herbivores, including the duck-billed hadrosaurs such as *Edmontosaurus* and *Maiasaura*, and the 'beaked' dinosaurs such as *Triceratops* and *Iguanodon*, appeared. They had snipper-like mouths, with cheeks to hold the food and grinding teeth for chewing. They mowed their way across the land, cropping the leaves from horsetails and ferns. As these plants were eaten, so another group grew up to take their place — the flowering plants.

BEAUTIFUL REVOLUTION

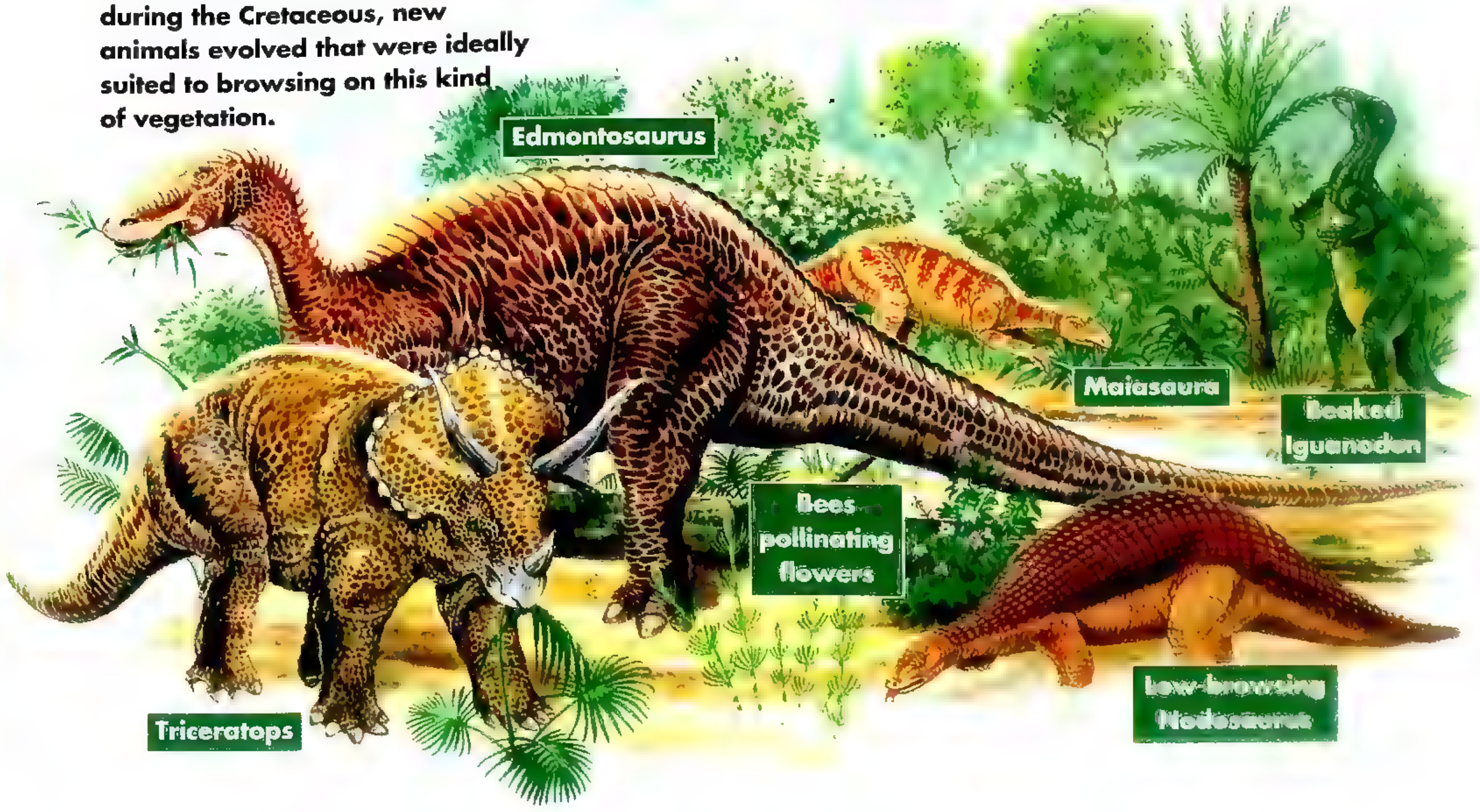
The first flowers may have appeared during the Triassic Period, but it was not until the Cretaceous herbivores cleared the way that they came into their own. Like today's flowers, early flowering plants produced seeds which were protected in a special box, called the ovary. This led to more seeds surviving, and more plants growing to produce seeds in their turn. Flowering plants became a great success, taking over from the conifers and ferns.

PLANT VICTORY?

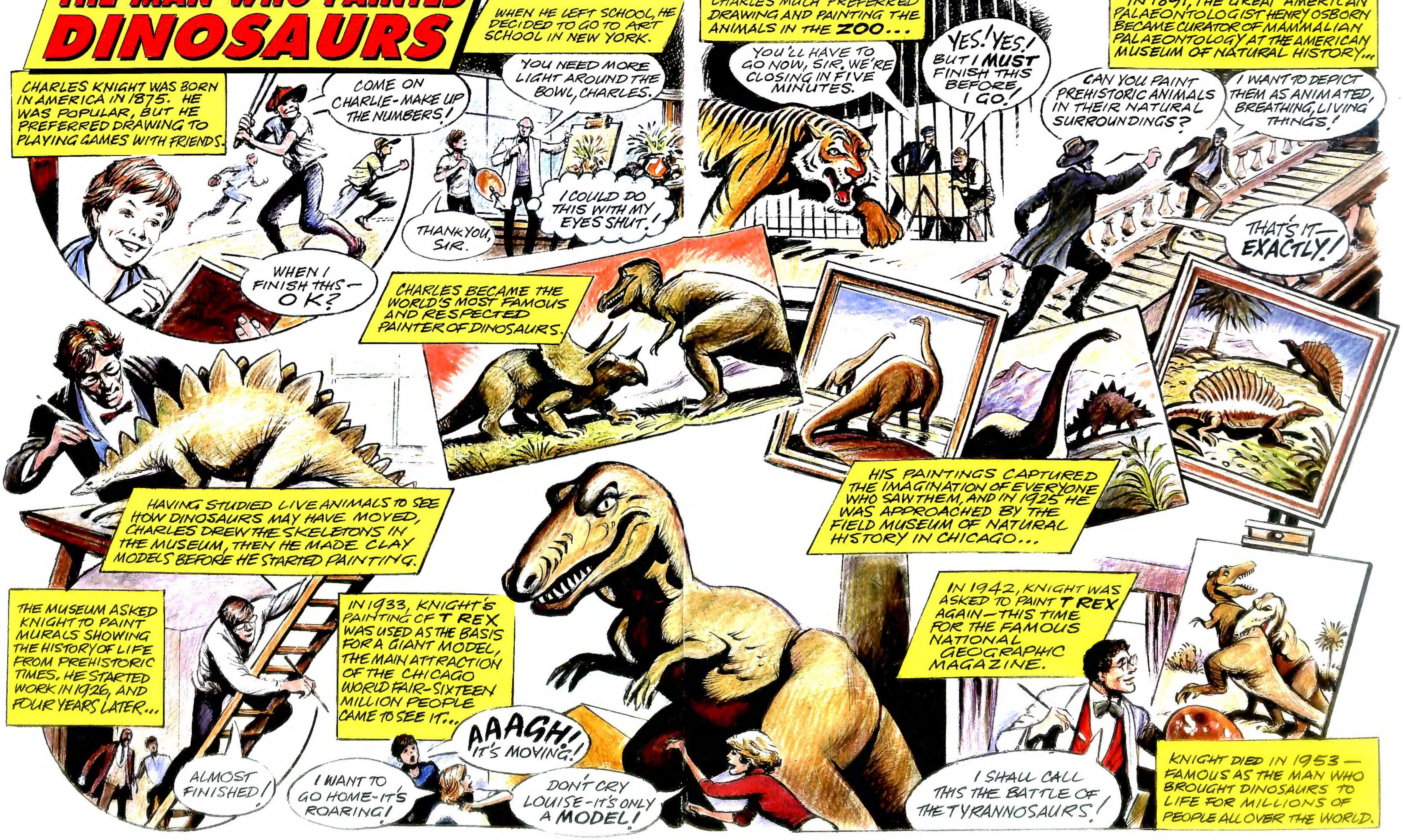
Early flowers, such as magnolias, were eaten by dinosaurs. But, when the dinosaurs mysteriously perished at the end of the Mesozoic Era, the flowering plants lived on. Today, they dominate gardens and fields, forests and jungles all over the world. So you could say that plants beat the plant-eaters after all!

CRETACEOUS SCENE

As low-growing plants flourished during the Cretaceous, new animals evolved that were ideally suited to browsing on this kind of vegetation.



THE MAN WHO PAINTED DINOSAURS


CHARLES KNIGHT WAS BORN IN AMERICA IN 1875. HE WAS POPULAR, BUT HE PREFERRED DRAWING TO PLAYING GAMES WITH FRIENDS.
COME ON CHARLIE - MAKE UP THE NUMBERS!
WHEN I FINISH THIS — OK?
WHEN HE LEFT SCHOOL, HE DECIDED TO GO TO ART SCHOOL IN NEW YORK.
YOU NEED MORE LIGHT AROUND THE BOWL, CHARLES.
THANK YOU, SIR.
I COULD DO THIS WITH MY EYES SHUT!
CHARLES MUCH PREFERRED DRAWING AND PAINTING THE ANIMALS IN THE ZOO...
YOU'LL HAVE TO GO NOW, SIR. WE'RE CLOSING IN FIVE MINUTES.
YES! YES! BUT I MUST FINISH THIS BEFORE I GO!
IN 1891, THE GREAT AMERICAN PALAEONTOLOGIST HENRY OSBORN BECAME CURATOR OF MAMMALIAN PALAEONTOLOGY AT THE AMERICAN MUSEUM OF NATURAL HISTORY...
CAN YOU PAINT PREHISTORIC ANIMALS IN THEIR NATURAL SURROUNDINGS?
I WANT TO DEPICT THEM AS ANIMATED, BREATHING, LIVING THINGS!
THAT'S IT — EXACTLY!
CHARLES BECAME THE WORLD'S MOST FAMOUS AND RESPECTED PAINTER OF DINOSAURS.
HIS PAINTINGS CAPTURED THE IMAGINATION OF EVERYONE WHO SAW THEM, AND IN 1925 HE WAS APPROACHED BY THE FIELD MUSEUM OF NATURAL HISTORY IN CHICAGO...
HAVING STUDIED LIVE ANIMALS TO SEE HOW DINOSAURS MAY HAVE MOVED, CHARLES DREW THE SKELETONS IN THE MUSEUM, THEN HE MADE CLAY MODELS BEFORE HE STARTED PAINTING.
THE MUSEUM ASKED KNIGHT TO PAINT MURALS SHOWING THE HISTORY OF LIFE FROM PREHISTORIC TIMES. HE STARTED WORK IN 1926, AND FOUR YEARS LATER...
ALMOST FINISHED!
IN 1933, KNIGHT'S PAINTING OF T REX WAS USED AS THE BASIS FOR A GIANT MODEL, THE MAIN ATTRACTION OF THE CHICAGO WORLD FAIR - SIXTEEN MILLION PEOPLE CAME TO SEE IT...
AAAGH! IT'S MOVING!
I WANT TO GO HOME - IT'S ROARING!
DON'T CRY LOUISE - IT'S ONLY A MODEL!
IN 1942, KNIGHT WAS ASKED TO PAINT T REX AGAIN — THIS TIME FOR THE FAMOUS NATIONAL GEOGRAPHIC MAGAZINE.
I SHALL CALL THIS THE BATTLE OF THE TYRANNOSAURS!
KNIGHT DIED IN 1953 — FAMOUS AS THE MAN WHO BROUGHT DINOSAURS TO LIFE FOR MILLIONS OF PEOPLE ALL OVER THE WORLD.

Improve and test your knowledge with...

FACT FILE

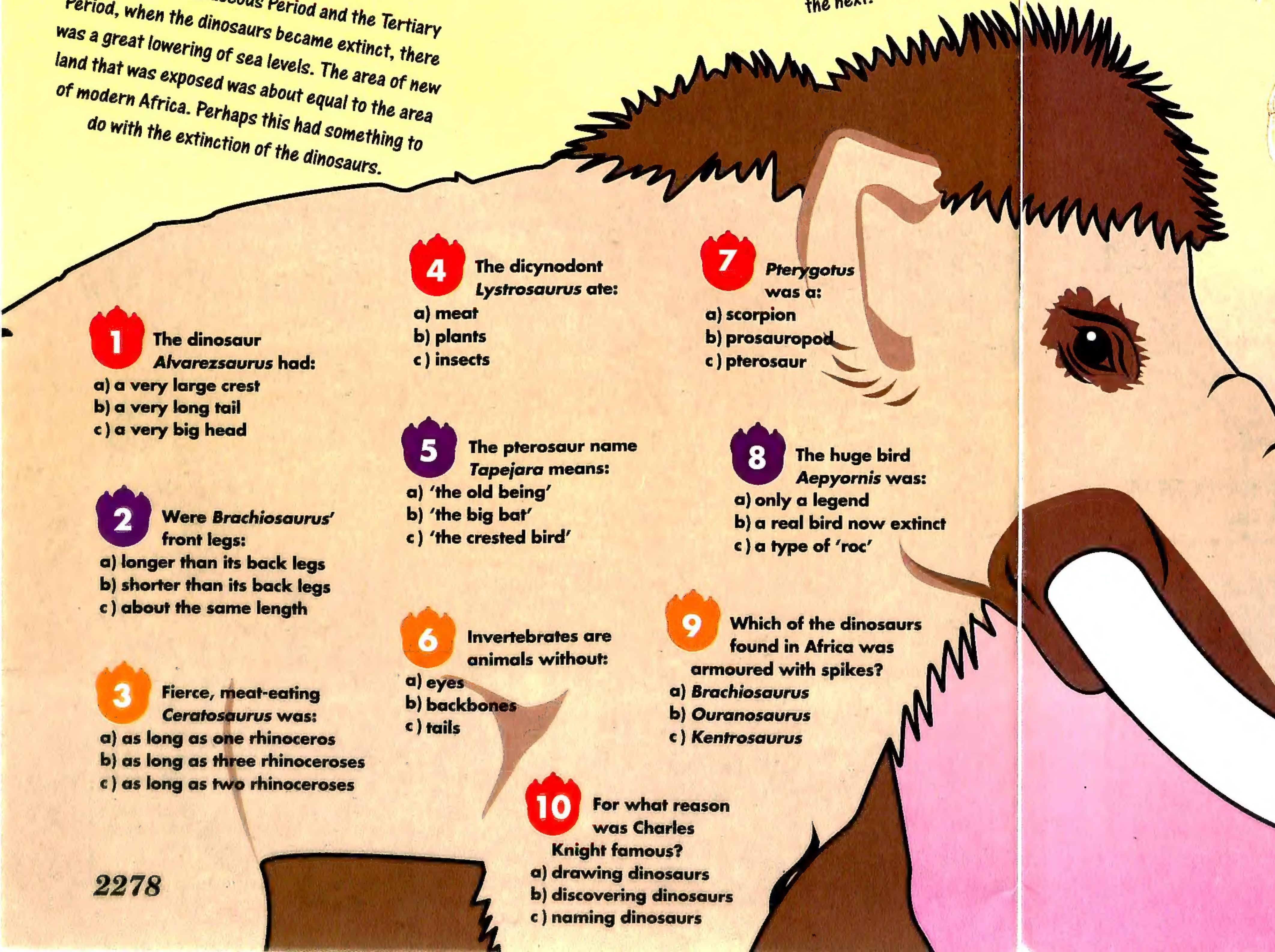
Follow the footprints on the mammoth's back and answer the questions posed!

More land – fewer dinos?

Between the Cretaceous Period and the Tertiary Period, when the dinosaurs became extinct, there was a great lowering of sea levels. The area of new land that was exposed was about equal to the area of modern Africa. Perhaps this had something to do with the extinction of the dinosaurs.

Baby lookalikes

Experts believe that all ceratopian youngsters looked like one another. Only the adults developed the strange horns and frills that distinguished one type from the next.



1 The dinosaur *Alvarezsaurus* had:
a) a very large crest
b) a very long tail
c) a very big head

2 Were *Brachiosaurus'* front legs:
a) longer than its back legs
b) shorter than its back legs
c) about the same length

3 Fierce, meat-eating *Ceratosaurus* was:
a) as long as one rhinoceros
b) as long as three rhinoceroses
c) as long as two rhinoceroses

4 The dicynodont *Lystrosaurus* ate:
a) meat
b) plants
c) insects

5 The pterosaur name *Tapejara* means:
a) 'the old being'
b) 'the big bat'
c) 'the crested bird'

6 Invertebrates are animals without:
a) eyes
b) backbones
c) tails

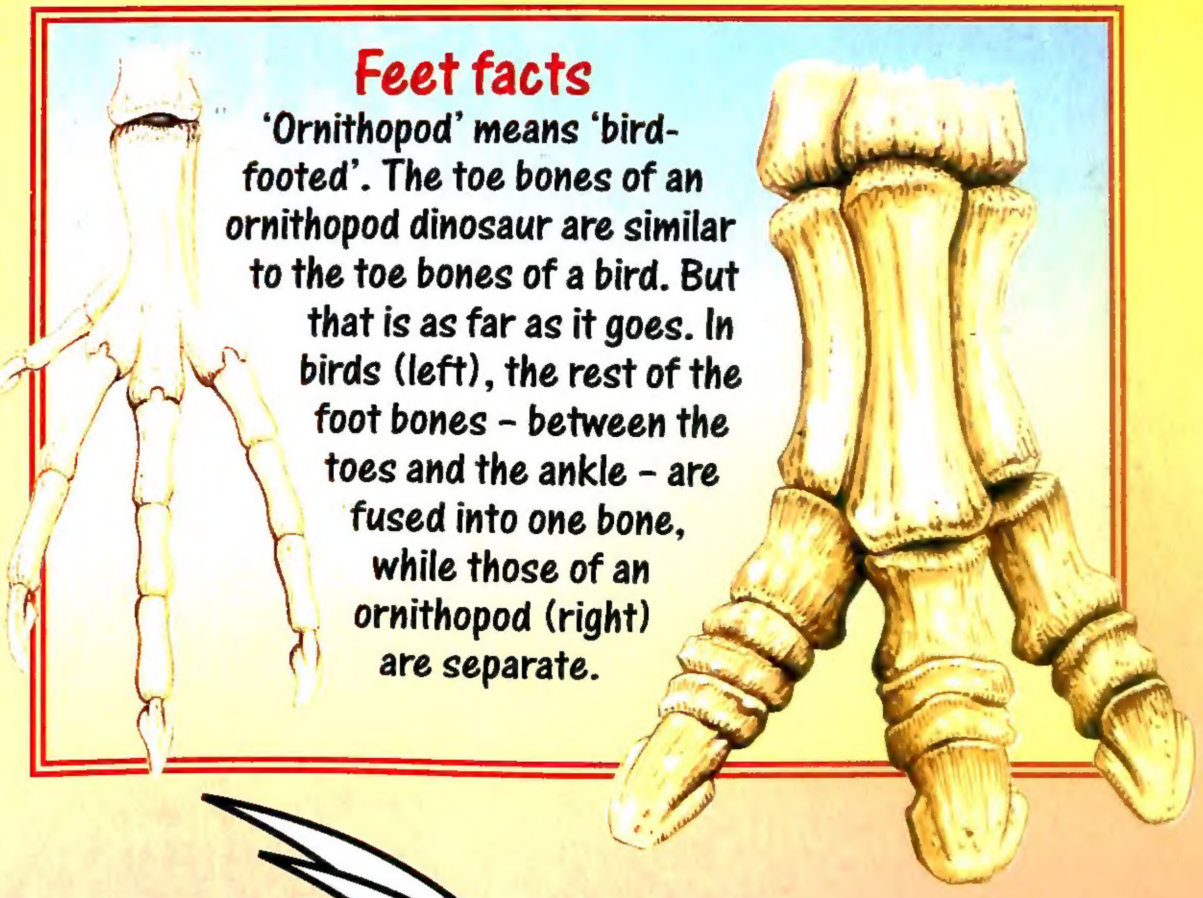
7 *Pterygotus* was a:
a) scorpion
b) prosauropod
c) pterosaur

8 The huge bird *Aepyornis* was:
a) only a legend
b) a real bird now extinct
c) a type of 'roc'

9 Which of the dinosaurs found in Africa was armoured with spikes?
a) *Brachiosaurus*
b) *Ouranosaurus*
c) *Kentrosaurus*

10 For what reason was Charles Knight famous?
a) drawing dinosaurs
b) discovering dinosaurs
c) naming dinosaurs

Feet facts



'Ornithopod' means 'bird-footed'. The toe bones of an ornithopod dinosaur are similar to the toe bones of a bird. But that is as far as it goes. In birds (left), the rest of the foot bones – between the toes and the ankle – are fused into one bone, while those of an ornithopod (right) are separate.

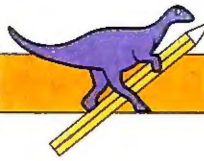
Let me out!

Some scientists think that the young *Velociraptor* kicked its way out of its egg by using its killer claw.

Keep on floating

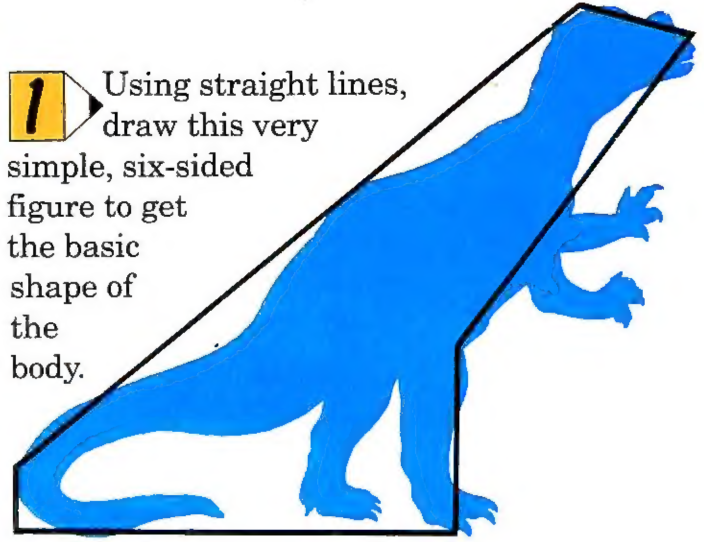
A *Megalosaurus* skeleton found in sea deposits in northern France must have come from 150km away. That is how far the nearest land was at the time. The dinosaur body must have floated a long way before sinking.

Answers to the questions on inside back cover

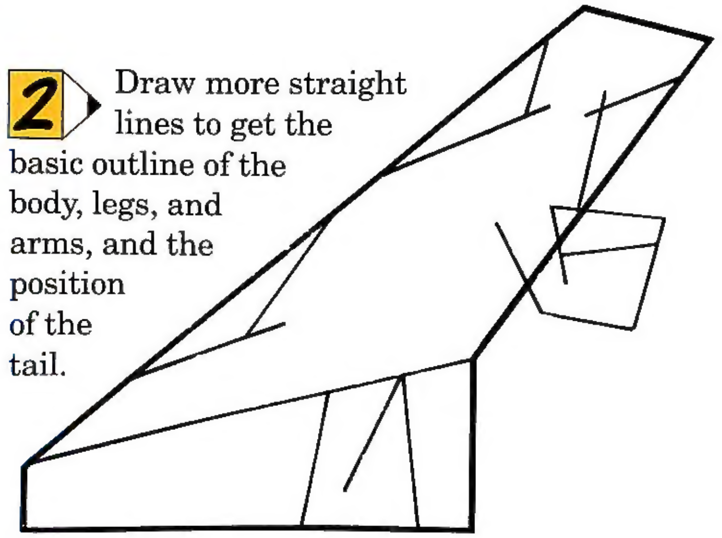


HOW TO DRAW

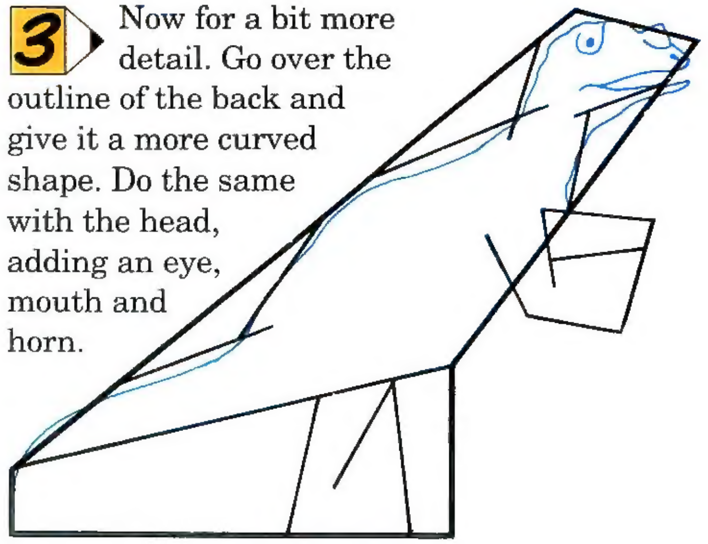
CERATOSAURUS



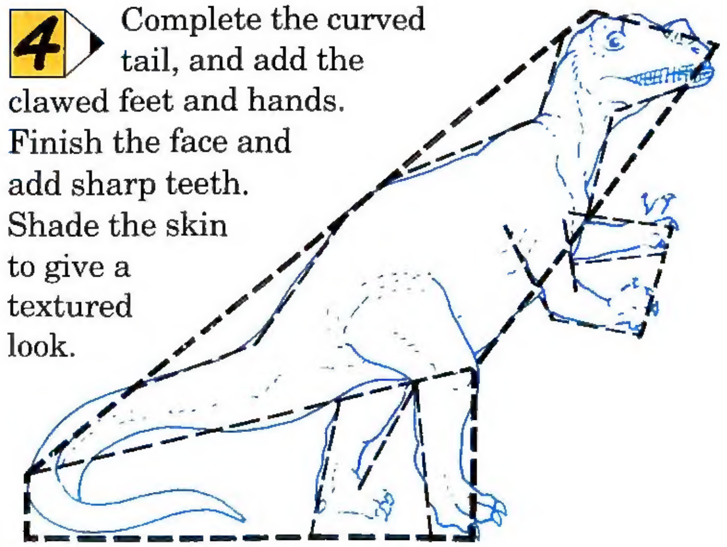
1 Using straight lines, draw this very simple, six-sided figure to get the basic shape of the body.



2 Draw more straight lines to get the basic outline of the body, legs, and arms, and the position of the tail.

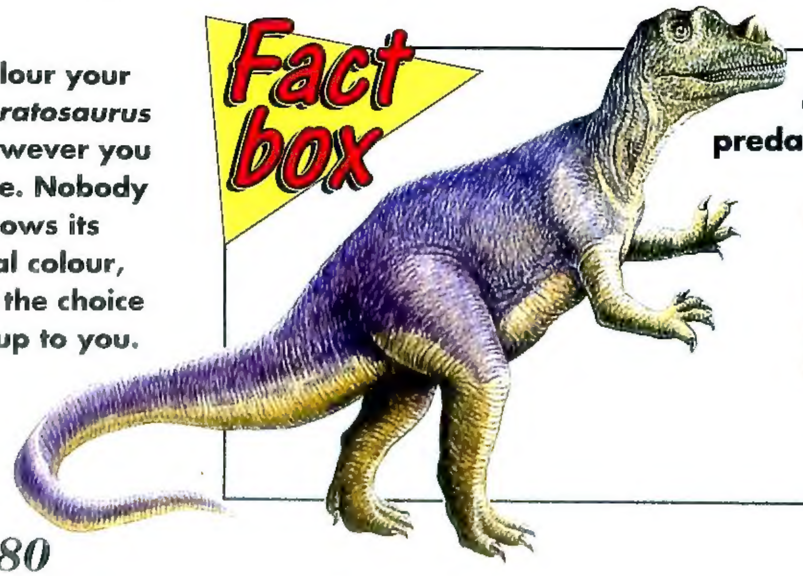


3 Now for a bit more detail. Go over the outline of the back and give it a more curved shape. Do the same with the head, adding an eye, mouth and horn.



4 Complete the curved tail, and add the clawed feet and hands. Finish the face and add sharp teeth. Shade the skin to give a textured look.

Colour your *Ceratosaurus* however you like. Nobody knows its real colour, so the choice is up to you.



Fact box

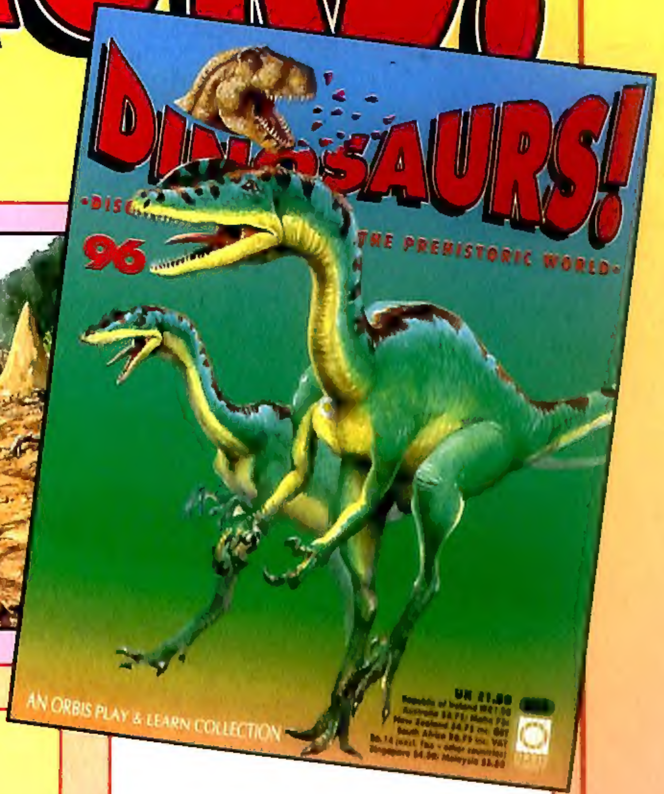
***Ceratosaurus* was a dangerous predator, as long as two rhinoceroses.**

- **NAME:** *Ceratosaurus* (ser-a-toe-saw-rus) means 'horned reptile'
- **SIZE:** up to 6m long and 2m tall
- **FOOD:** meat
- **LIVED:** about 160 million years ago in the Late Jurassic Period in North America and east Africa.

COMING IN PART 96 OF

DINOSAURS!

Discover who is the dinner and who is the diner in SPOTTER'S GUIDE. Ichthyosaurs change face in TIME DETECTIVE.



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Three amazing creatures in IDENTIKIT and HISTORY IN PICTURES 3-D GALLERY GIANTS OF THE PAST

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ANSWERS TO FACT FILE QUESTIONS: 1.b 2.a 3.c 4.b 5.a 6.b 7.a 8.b 9.c 10.a

Dr David Norman of Cambridge University answers your dinosaur questions

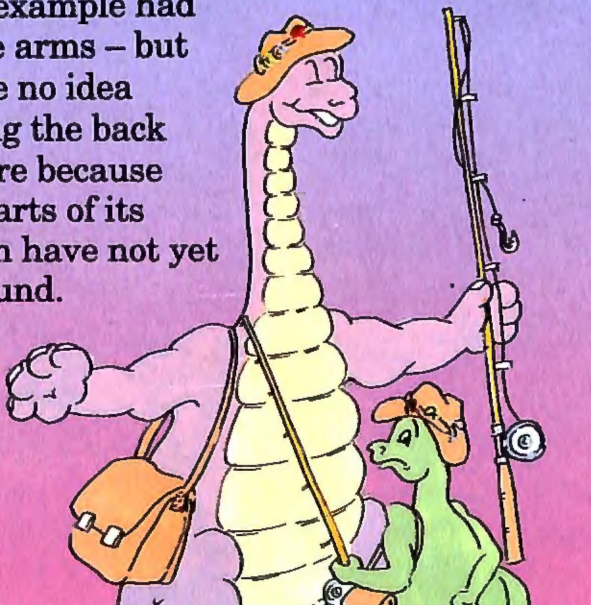
ASK THE EXPERT

Some modern reptiles have a salt gland. Might dinosaurs have had this gland?

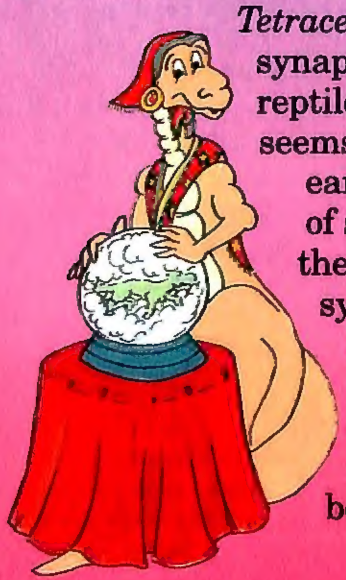
Reptiles use salt glands to get rid of any excess salt in their bodies. There are several openings on the sides of the skulls of many dinosaurs, and it has often been suggested that salt glands were in some of these openings. It is almost impossible to know whether this was the case, but I think it likely that salt glands existed, as they are found in some of the dinosaurs' closest living relatives.

Did any dinosaurs have longer front legs than back legs?

The only really well-documented dinosaur whose front legs were longer than the back ones was *Brachiosaurus*. This is the famous giraffe-like sauropod dinosaur. There are other dinosaurs which seem to have very long front legs – *Deinocheirus* for example had huge arms – but we have no idea how long the back legs were because these parts of its skeleton have not yet been found.



What sort of animal was Tetraceratops?



Tetraceratops belonged to the synapsid or mammal-like reptile group of animals. It seems to have been one of the earliest of a general group of synapsids known as therapsids. Earlier synapsids were still lizard-like, whereas therapsids were more mammal-like, with shorter tails, chunkier bodies and longer legs.

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